Spring 2007

CEG 751-01: Microprocessors II

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CEG 751: Microprocessors II
(Spring 2007, 4:10 – 5:25 Tue. Thr. at 339 RC)

Instructor: Jack S.N. JEAN

Office Hours: 10-10:50 M., W., F.; 3:10-4 PM, M, Tue, W, Thr; 334 RC, 775-5106, email: jjean@cs.wright.edu

Course Format: The classes will meet at RC 339 for project discussion and implementations. Lectures are given only initially to clarify project requirements and to provide background information. There is no textbook and no test.

Project: The project consists of six phases and is to be done by a team of two or three students.

> **Phase 1:** Define an application which utilizes an MC9S12C32 microcontroller board and requires communication between the microcontroller and a PC via a USB-I2C-IO card. The communication should move at least 1K bytes. One way communication is fine. In addition, the 6811 task should be of reasonable complexity that can demonstrate the advantage of using multi-tasking implementation. Some inter-task synchronization using semaphore(s) is required. Turn in a one or two page short description to outline (1) the application, (2) the multi-tasking implementation, (3) a non-multi-tasking implementation, and (4) the tradeoff analysis.
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> **Phase 2:** Implement the hardware and (non-multi-tasking) software for the application while the PC software should use the USB-I2C-IO API functions.
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> **Phase 3:** Build your own USB-I2C-IO API functions and modify your application software so as to explore USB block transfer. The resulting data transfer rate should be as high as possible.
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> **Phase 4:** The 6812 software should be modified to be a multi-tasking implementation based on a SALVO-lite RTOS (real time OS). For the set of SALVO functions used in your application, design and specify their internal workings in terms of block diagrams, pseudo codes, and text description.
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> **Phase 5:** Implement those SALVO functions and test them with your application.
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> **Phase 6:** Modify those SALVO functions so that the task scheduling becomes preemptive. If necessary, modify your application to take advantage of the new feature.

Project Option: A student may propose to work on a different project as long as the instructor deems appropriate.

Final Report: Each team needs to turn in a 10- to 20-page (excluding schematics and code listing) final report at the end of the quarter to summarize and comment on the project results. Schematics and code listing should be attached. There will be penalty on typos and grammatical errors. Lessons learned or problems encountered in the project must be documented in the report. The report will not be returned.

Grading: Grading will be based on project result and instructor's (subjective) evaluation. Team members do not necessarily get the same grade.